

Amendments to the Claims

This listing of claims will replace the originally filed claims in the application.

Listing of Claims:

Claims 1 – 12 (cancelled)

Claim 13 (new): A method for processing aluminum in a furnace, in which an aluminum-containing material and, optionally, one or more salts, are introduced into the furnace, this material is melted by heating using at least one burner supplied with oxidizer and with fuel, in order to obtain molten aluminum possibly covered with a slag comprising, in particular, alumina and at least one salt, and the carbon monoxide CO and/or hydrogen H₂ concentration is measured in the furnace atmosphere or in the flue gases, wherein the oxidizer supplied to at least one burner comprises over about 10% by volume of oxygen, preferably over about 21% by volume of oxygen, and in that the method comprises a final phase for decreasing the oxidation of the molten aluminum, during which the oxidizer flow rate is substantially constant while the flow rate of fuel injected into at least one burner is a function of the carbon monoxide and/or hydrogen concentration in the atmosphere or the flue gases or vice versa, this carbon monoxide and/or hydrogen concentration being regulated to a setpoint C2 of between about 3 vol% and about 15 vol%.

Claim 14 (new): The method of claim 13, wherein the oxidizer comprises over about 88 vol% of O₂, preferably over about 95 vol% of O₂.

Claim 15 (new): The method of claim 13, wherein the oxidizer is industrially pure oxygen.

Claim 16 (new): The method of claim 13, wherein the fuel is selected from natural gas, hydrocarbons, and light or heavy fuel oil.

Claim 17 (new): The method of claim 13, wherein the volumetric ratio of oxygen to fuel is maintained between about 1 and about 5, preferably between about 1.5 and about 3.

Claim 18 (new): The method of claim 13, wherein the carbon monoxide and/or hydrogen concentration is maintained substantially constant throughout this oxidation limitation phase at a value C2 of between about 3 vol% and about 15 vol%, preferably between about 6 vol% and about 10 vol%.

Claim 19 (new): The method of claim 13, wherein the oxidation limitation phase is preceded by a hydrocarbon combustion phase during which substantially all the organic compounds present in the material are destroyed by pyrolysis.

Claim 20 (new): The method of claim 19, wherein the hydrocarbon combustion phase is considered to terminate when the measured value of the ratio R of the volumetric flow rate of oxygen to the volumetric flow rate of fuel falls below a predefined value S.

Claim 21 (new): The method of claim 19, wherein a stabilization phase takes place with a measured CO and/or H₂ concentration regulated to the setpoint C1, this phase terminating when the ratio R reaches its minimum.

Claim 22 (new): The method of claim 13, wherein the aluminum oxidation limitation phase terminates with the reintroduction, into the furnace, of a new charge of aluminum-containing material.

Claim 23 (new): The method of claim 13, wherein the CO concentration is measured using a laser diode.

Claim 24 (new): The use of a laser diode for measuring CO in a method of claim 13.